18.1250
24.7500

S/170/60/003/03/15/034
B014/B007

AUTHORS: Dekhtyar, I. Ya., Mikhalenkov, V. S.

TITLE: The Relationship Between the Nonequilibrium Defects of the Crystal Structure and the Diffusion Parameters in Nickel Alloys

PERIODICAL: Inzhenerno-fizicheskiy zhurnal, 1960, Vol. 3, No. 3, pp. 91-95

TEXT: The present paper is one of a series of papers by the authors (Refs. 5-8), in which the diffusion in materials deformed at high temperatures was investigated. Investigations were carried out of nickel-molybdenum alloys, armco-iron, and a ferritic iron alloy with 12% Cr and 4% W. In the case of the nickel-molybdenum alloys the indicator used was Co^{60}, and in the iron alloy it was Fe^{59}. From the diagrams shown in Figs. 1 and 2 it may be seen that the dependence of the diffusion coefficient on the deformation rate is linear. For the purpose of explaining this effect a model is suggested according to which an excessive concentration of vacancies occurs during the slow deformation, which is accompanied at the same time by a mutual interaction of dislocations. Basing upon this model, the authors calculated the diffusion coefficient in the case of plastic deformation, which is represented as linear function of the deformation rate. The values

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The Relationship Between the Nonequilibrium   S/170/60/003/03/15/034
Defects of the Crystal Structure and the   B014/B007
Diffusion Parameters in Nickel Alloys

show good agreement with experimental data. Finally, the activation energy
of diffusion is dealt with. A diagram, Fig. 3 compares the experimental
values which represent the dependence of the activation energy of diffu-
sion on the deformation rate for the Ni-Mo-alloys, with the curve calculat-
ed by means of formula (8). The values were found to be in good agreement.
The activation energy at first quickly decreases with increasing deforma-
tion rate, whilst later on it develops more slowly. In conclusion, the
usefulness of the model for diffusion suggested is pointed out. There
are 3 figures, 2 tables, and 15 references: 8 Soviet and 7 English.

ASSOCIATION: Institut metallofiziki AN USSR, g. Kiyev
               (Institute of Metal Physics of the AS UkrSSR, City of Kiyev)

Card 2/2

86809

i500   *1413, 1418.*

3/185/60/005/001/008/018
A151/A029

HORS: Gertsriken, S.D.; Dekhtyar, I.Ya.; Mikhalenkov, V.S.; Madatova,
e.G.

The Study of the State of Atoms in Solid Iron - Aluminum Solutions
by the Electrical Transfer Method

PERIODICAL   Ukrayins'kyy Fizychnyy Zhurnal, 1960. Vol 5. No 1. pp 79 - 87

TEXT: The paper investigates the state of atoms in solid iron - aluminum
solutions by applying a method based on the effect of displacement of inert marks
in a direct current field. Samples of a homogeneous solid solution of Fe and Al were
used which had the form of lengthened small semicylinders with a diameter of $5mm^2$
and a length of 40 mm. Apertures with a diameter of 0.5 mm were drilled perpendio-
ularly to the axis of such a sample, through which molybdenum wires were pulled.
The sample was tightly clamped between two nickel electrodes, placed in a wide
glass tube of a vacuum installation. The electrolytic current served simultane-
ously as a source for heating the samples. In a number of cases when direct
current could not ensure the pre-set temperature, additional heatings by alternat-
ing current were applied. As proved by former experiments, a displacement of

86809

S/185/60/005/00: /30c/0:2
A151/A029

The Study of the State of Atoms in Solid Iron - Aluminum Solutions by the E   r
cal Transfer Method

marks in the direction to the anode took place after a certain annealing   The
location of the marks in relation to the edges of the sample and to the lines
near its cold ends was measured on a comparator with an ac .-acy of + 0 · ....
The observation of the displacement gave a clear evidence for the presence of ·.
Kirkendall effect within the direct current circuit. Alternating current pass
through did not lead to any displacements of the marks. It was discovered tha
in all cases investigated the displacement of the marks proceeds in the dire-.. .,
to the anode. Bearing in mind that in the investigated alloys with little alum:r.
um content the majority of places in the lattice was occupied by iron atoms, it
can be assumed that the dosplacement of marks is conditioned chiefly by the motion
of iron ions. Formula (6) shows that this displacement should be proportional to
the duration of annealing t. The displacement of marks proceeding in the direct-
ion of the anode led to the conclusion that under such conditions of the experiment.
the ions of iron are positively charged. On the basis of Formula (12), the numbers
U of the transfers of ions of iron at $1,300^{\circ}C$ were calculated   They proved to be
$4.6 \cdot 10^{-6}$ and $3.45 \cdot 10^{-6}$ g-ion/farad for alloys containing 2 5 and 8 weight % of
Al, respectively   The results obtained make it possible to calculate the charges
of iron ions with an accuracy of up to the multiplier constant   The calculation
Card 2/3

86809

S/185/60/005/001/008/018
A151/A029

Study of the State of Atoms in Solid Iron - Aluminum Solutions by the Electri-
Tans er Method

...l ...t in this paper has shown that the positive charge of iron ions in an
... ... ith a 2.5% aluminum content is aproximately twice as high compared to their
... ... in an alloy with 8% of aluminum. In order to determine the real value of
... ion charge, as well as the symbol and the value of the charge of the second
alloy component, it seems necessary to make the calculation conducted more precise.
There are 4 figures and 11 references: 7 Soviet, 2 English, 1 German and 1 un-
indentified.

ASSOCIATION: Instytut metalofizyky AN URSR (Institute of the Physics of Metals,
AS UkrSSR)

SUBMITTED: June 29, 1959

Card 3/3

88043

S/139/60/000/006/006/032
E032/E314

24.2200

AUTHORS: Dekhtyar, I.Ya. and Mikhalenkov, V.S.

TITLE: Effect of All-sided Pressure on the Atomic
Magnetic Moment of Iron, Nickel and the
Fe+36% Ni Alloy

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy,
Fizika, 1960, No. 6, pp. 44 - 51

TEXT: A study is reported of the variation in the atomic
magnetic moments with pressure in electrolytically pure Fe
and Ni and in an alloy containing 36% Ni. The high-pressure
device employed was of the form described by Lazarev and
Kan in Ref. 8. The "bomb" employed to produce high pressures
is shown in Fig. 1. The bomb is made of Be-bronze . The
specimen 3 is fixed in a holder 2 which, in turn, is held
in position by the plug 1 , which is screwed into the
body 4 . In order to produce a hermetic seal molten tin
was introduced between 4 and 1 . At the other end of the
bomb a capillary 6 was provided (diameter 1 mm, length
22 mm). The bomb was first heated to a temperature of

Card 1/4

88043
S/139/60/000/006/006/032
E032/E314

Effect of All-sided Pressure on the Atomic Magnetic Moments of Iron, Nickel and the Fe+36% Ni Alloy

33 to 35 deg by immersion in a water bath, and the hollow space was filled with liquid gallium through the capillary. The water jacket 7 was then placed on the end of the bomb and the latter was removed from the water bath. As a result of the intensive cooling of the end of the bomb by the water jacket, the gallium present in the capillary solidified first, thus sealing-off the device. The high pressure was produced by the remaining amount of gallium inside the hollow cavity which solidified soon after. The pressures produced in this way are quite large since the change in the volume of gallium on solidification (29 $^\circ$C) is about 3.3%. In fact, pressures up to 13 000 atm. could be obtained at room temperature. The atomic magnetic moments of the specimens under investigation were measured in a field of 3 000 Oe (which was sufficient to produce saturation), using the method described by Permyakov et al in Ref. 9.

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88043

S/139/60/000/006/006/032
E032/E414

Effect of All-sided Pressure on the Atomic Magnetic Moments
of Iron, Nickel and the Fe+36% Ni Alloy

The specimen in the bomb and a standard specimen were placed in a
special holder at an angle of 90° to each other, and were inserted
into the field.   The holder was suitably suspended so that it
could rotate freely in the field.   In the absence of pressure
acting on the specimen under investigation the specimen and the
standard came to rest at an angle of 45° to the field.   If the
magnetization of the specimen changes on application of pressure,
then there will be a change in the angle between the specimen and
the field.   It was found that the atomic magnetic moments of the
above three materials decreased on application of pressure.   The
reduction is 3.5% for the Fe-Ni alloy and 1.8 and 0.7% for pure
Fe and Ni respectively.   These results are interpreted in terms
of the s-d exchange model of Vonsovskiy (Ref.12).   They are
consistent with this theory but further experimental data are
still necessary.   There are 1 figure and 14 references:
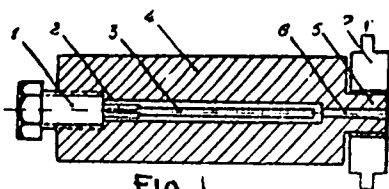8 Soviet and 6 non-Soviet.

Card 3/4

88043

S/139/60/000/006/006/032
E032/E414

Effect of All-sided Pressure on the Atomic Magnetic Moments
of Iron, Nickel and the Fe+36% Ni Alloy

ASSOCIATION: Kiyevskiy politekhnicheskiy institut
(Kiyev Polytechnical Institute)

SUBMITTED: February 10, 1960

Fig.1.

Fig.1

Card 4/4

S/081/61/000/019/00У085
B101/B110

AUTHORS: Gertsriken, S. D., Dekhtyar, I. Ya., Mikhalenkov, V. S.,
              Madatova, E. G.

TITLE: Study of the electrolytic conductivity of solid iron -
              aluminum alloys

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 19, 1961, 31, abstract
              19B227 (Sb. "Issled. po zharoprochn. splavam", M., AN SSSR,
              v. 6, 1960, 99 - 104)

TEXT: The electric migration in Fe - Al alloys (2.5 % by weight of Al)
at 1300°C was studied by the method of displacing an inert marker. In all
cases, the markers moved toward the anode in electric migration. Since the
displacement is due to the Kirkendall effect, Fe ions migrate to the cathode
and are positively charged. It was shown that the ionic charge can be
determined from the activation energy of diffusion and from that of motion
of the markers. [Abstracter's note: Complete translation.]

Card 1/1

DEKHTYAR, I.Ya.; MIKHALENKOV, V.S.

Effect of nonequilibrium defects of crystal structure on the mobility of atoms in nikel and iron alloys. Issl. po zharopr. splav. 6:120-129 '60.
(MIRA 13:9)
(Crystal lattices)   (Nickel-iron alloys--Metallography)

$|\mathcal{X}\, 7 \mathcal{S}\, 10$

32031
S/601/60/000/011/010/014
D207/D304

AUTHORS: Dekhtyar, I. Ya., and Mikhalenkov, V. S.

TITLE: The effect of crystal imperfections on the
             parameters of diffusion in nickel alloys

SOURCE: Akademiya nauk Ukrayins'koyi RSR. Instytut
             metalofyzyky. Sbornik nauchnykh rabot. no.
             11. 1960. Voprosy fiziki metallov i metallo-
             vedeniya, 106-116

TEXT: The authors investigated the effect of imperfections
generated by high-temperature plastic deformation on diffusion
in Ni-Mo alloys (6.5 - 16.7 at.% Mo), in Armco iron, and in a
ferrite-type alloy (0.12 C, 12 Cr, 0.7 Mo, 4 W, 0.2 V, and the
rest Fe--all in weight %). Deformation was produced by applying
an axial compressive load during diffusion annealing. Friction
was avoided by placing mica foil between the sample ends and the
compression-machine plungers. Radioactive tracers (Co^{60} for

Card 1/4

32031
S/601/60/000/011/010/014
D207/D304

The effect of...

Ni-Mo and iron; Fe^{59} for the ferrite) were deposited on the sample ends in the form of 1μ thick layers. Diffusion coefficients D were deduced from the tracer distributions along the samples. These distributions were found using an end-window-counter $MCT-17$ (MST-17), making an allowance for the change in dimensions due to deformation. The coefficients D were found to be directly proportional to the rate of deformation ė in the following cases: Co diffusion in the Ni-Mo alloys at 950 - 1150°C at low rates of deformation (up to 1.5% per hour); Co diffusion in Armco iron at 750°C; Fe diffusion in the ferrite at 900 and 1000°C. This proportionality can be accounted for by assuming that new vacancies are generated by dislocations during plastic deformation. A "softening coefficient" R was defined as $R = dD/dė$. The value of R of the Ni-Mo alloys was of the order of 10^{-6} cm^2 at 950 - 1150°C; it rose with temperature and had a minimum at 9.6% Mo, where a maximum of the diffusion activation energy is known to occur. For Armco iron at 750°C,

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32031

S/601/60/000/011/010/014
D207/D304

The effect of...

it was found that $R = 3.2 \times 10^{-5}$ cm^2, while for the ferrite at 900 and 1000°C the values of R were 4.3×10^{-5} and 5.8×10^{-5} cm^2 respectively. The number of dislocations N_d interacting with vacancies was found from $N_d \sim R^{-1}$. For the Ni-Mo alloys at 950 - 1150°C, the value of N_d was of the order of 10^6 cm^{-2}; for Armco iron at 750°C, $N_d = 9.4 \times 10^5$ cm^{-2}, and for the ferrite at 900 and 1000°C, $N_d = 6.6 \times 10^4$ and 4.8×10^4 cm^{-2} respectively. These values of N_d indicated that only a proportion of dislocations interacted with vacancies. Alternatively, N_d represented dislocation clusters rather than single defects. The diffusion activation energy E_a of the Ni-Mo alloys was 35 - 80

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The effect of....

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D207/D304

kcal/g-atom, and it fell with increase of the rate of deformation.
There are 4 figures, 3 tables and 15 references: 8 Soviet-bloc
and 7 non-Soviet-bloc. The references to the English-language
publications read as follows: F. S. Buffington, M. Cohen, J.
Metals, 4, no. 8, 1952; F. Seitz, Advances in Physics, 1, 43,
1952; I. Molenar, W. Aarts, Nature, 166, 690, 1950

X

SUBMITTED: June 24, 1959

Card 4/4

81718

24.6800
24.6520

S/020/60/133/01/16/070
B014/B011

AUTHORS: Dekhtyar, I. Ya., Mikhalenkov, V. S.

TITLE: A Study of the Angular Correlation of Gamma Quanta Arising
in the Annihilation of Positrons and Electrons in Bismuth

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 133, No. 1,
pp. 60-63

TEXT: To determine the surface of maximum momenta in the study of angular
distribution of γ-quanta the authors used a device allowing the measurement
of the intensity of photon momenta at different angles. Na^{22} was used as
positron source, and a scintillation counter served as detector. The au-
thors studied 2 mm thick bismuth single crystal plates. Fig. 1 shows a
typical angular distribution, and Fig. 3 the average maximum momenta of
electrons in the form of polar diagrams. When analyzing the diagrams one
finds an asymmetry of the curve shape of the angular correlation of
γ-quanta in the annihilation of positrons by electrons for different direc-
tions in bismuth. From a study of the zonal structure of bismuth the
authors conclude that the quantity characterizing the form of the distribution

Card 1/3

A Study of the Angular Correlation of Gamma   S/020/60/133/01/16/070
Quanta Arising in the Annihilation of   B014/B011
Positrons and Electrons in Bismuth

function of the electron states, as well as the quantity characterizing
the average maximum momenta, reflect the surface of filled energy levels.
It results from an analysis of the curves of the angular correlations
for three different orientations of the bismuth crystal that the maximum
anisotropy of the form of the surface of filled energy levels, according
to the halfwidth of the distribution curves, is 10.5%, and according to
the average maximum momenta, 12.2%. These values of anisotropy approach
those values that can be estimated from the form of the cross section
according to the boundaries of the principal zone. The authors thank
A. A. Smirnov and M. A. Krivoglaz for valuable advice given. There are
4 figures and 6 references: 1 Soviet, 4 American, and 1 British.

ASSOCIATION: Institut metallofiziki Akademii nauk USSR
              (Institute of Metal Physics of the Academy of Sciences,
              UkrSSR)

PRESENTED: February 9, 1960, by G. V. Kurdyumov, Academician

Card 2/3

S/185/61/006/001/010/011
D210/D305

18 7500

AUTHORS   Hertsriken, S D , Dekhtyar, I Ya , Mikhalenkov, V S,
and Falchenko, V M

TITLE·   Study of electrical transfer in steels by the method
of inert tags

PERIODICAL   Ukrayins kyy fizychnyy zhurnal. v 6 no 1. 1961.
129-135

TEXT: This study is a continuation of a previous work (Ref 5
 , Hertsriken, I Ya Dekhtyar, v s Mikhalenkov, A H Madatova,
UFZh. 5 79 1960. in which details of the investigation method
were described In this article it is only stated that molybdenum
inert tags were used incorporated into the studied samples and
that their dislocation was measured by means of a comparator with
precision of 2 m in the present work two kinds of steel 40
and U8 with carbon contents 0 35 and 0 7, respectively were stu-
died As inert tags are able to move only into vacant nodes of cry-
stal-lattices the latter have to be abandoned by iron ions the

Card 1/4

Study of electrical transfer

./185/61/006/001/010/011
./210/0305

direction of tags motion is opposite to that of iron ions The
mass of transferred ions expressed in gram-ions equals $M \cdot \frac{Sq}{V}$

where S - the magnitude of the tag dislocation q - the cross sec-
tion of the sample V - the molar volume The number of tags trans-
fer n equals $n = \frac{UF}{V_i}$ where V velocity of tag motion F - Faraday,

i - current density V molar volume Experiments were carried out
at 945 and 1020°C the temperature controlled by a chromium-aluminum
thermocouple with a direct current density of 12 15 a/mm² / Abstrac-
ter's note In the given table the current density is given as
10 3a/cm² / The dependence of the magnitude of tags displacement
from the time of passing the direct current is a linear one for
each sample, temperature and current density In all the experi-
ments it has been found that tags were displaced toward the cathode
and iron-ions - toward the anode The authors explain this phenom-
enon as the result of interaction of and 'e electrons. the carbon
valency electrons filling the 3d energy level of iron atoms. confer-
ring on them a negative charge At every time-moment only a part of

Card 2/4

Study of electrical transfer

S/185/61/006/001/010/011
D210/D305

iron atoms form negatively charged ions and are able to migrate
toward the anode. The velocity of iron ions migration was found
to increase with the rise of temperature which is not in agree-
ment with experiments on 0.1% carbon steel. The authors endeavor-
ed to determine the iron ions electric charge by means of the
formula $E_a - \omega - RT$ycthy where E_a activation energy of diffu-
sion and ω activation energy of the process, but found that the
value of G is too similar to that of E_a and therefore the formu-
la was useless. They used instead another formula $z = \frac{RTAU}{\gamma 2 \delta d}$
where z electric charge σ specific gravity ρ specific
electric resistance diffusion coefficient. The values of z
have been found as follows. For steel 40 1.4 at 945°, and 1.03
at 1020°, for steel U8 0.85 at 945°, and 0.35 at 1020° which
proves the decrease of the electric charge with the rise of temper-
ature and the rise in carbon content. These results are regarded
by the authors as relatively correct only. This statement has
been verified by the authors by determining the micro-hardness of
samples after treatment. Sample of steel 40 was subjected to

Card 3/4

study of electrical transfer

S/185/61/006/001/010/011
0210/0305

the action of direct electric current density 15 000 a/cm^2 for
4 hours at 1020°C and after quenching, the distribution of micro
hardness was studied. The hardness of the anode part of the sample
markedly decreased and at the cathode end increased which proves
the migration of carbon ions towards the cathode. The cathode
part of the sample seemed to be composed entirely of martensite,
while the anode part was almost of pure ferrite with a few inclu-
sions of martensite. There are 5 figures, 1 table and 9 references:
7 Soviet-bloc and 2 non-Soviet-bloc. The references to the English-
language publications read as follows: H W Mead, C E Birchenal,
J Met 8 sec 2 1956, Metals handbook A S M Cleveland, 1948

ASSOCIATION   Institut metalofiziki AN USSR Kiyev Institute
               of Metallophysics, AS UkrSSR, Kiyev

SUBMITTED   June 18 1960

Card 4/4

DEKHTYAR, I.Ya.; MIKHALENKOV, V.S.

Method of studying the energy state of electrons in metals by
means of the positron-electron annihilation phenomenon. Sbor.
nauch.rab.Inst.metallofiz.AN URSR no.12:46-60 '61.   (MIRA 14:8)
                    (Electrons) (Fermi surfaces)

S/196/62/000/018/005/017
E194/E155

AUTHORS: Dekhtyar, I.Ya., and Mikhalenkov, V.S.

TITLE: Changes in the electrical resistance of copper-manganese alloys during plastic strain

PERIODICAL: Referativnyy zhurnal, Elektrotekhnika i energetika, no.18, 1962, 4, abstract 18 B 20. (Sb. nauchn. rabot In-ta metallofiz.AN UkrSSR. no.13, 1961, 62-69).

TEXT: The additional specific resistivity $\Delta\rho$ caused by plastic strain is expressed by the formula:

$$\Delta\rho = A\varepsilon^{1/2} + B\varepsilon^{3/2}$$

in which the first term characterises the contribution to Δ of dislocation and the second that of vacancy (A and B are coefficients that depend upon the material; ε is the amount of strain). Published experimental data are evidence of the different contributions of vacancy and dislocation to $\Delta\rho$ in different metals and alloys. In the present work alloys of copper with 0.54; 1.0; 1.35; and 2.07 % (atomic) Mn and pure electrolytic copper were

Card 1/2

Changes in the electrical ...

S/196/62/000/010/005/017
E194/E155

investigated.   A wire 0.5 mm in diameter was produced by forging
and drawing and to relieve the stresses it was annealed for 3 hours
at 900 °C in vacuum.   The specimens were 10 cm long.   A high level
of strain was produced by twisting.   For almost all specimens there
was an almost linear relationship between $\Delta\rho$ and the number of
rotations in twisting.   For alloys of Cu-Mn the greatest rates of
increase of ρ on strain are obtained for the content Mn 1.5%
(atomic).   On the basis of the irregular distribution of stress
over the section on twisting the authors derive a relationship
between $\Delta\rho$ and the length of the specimen, its radius and the
number of rotations.   This expression and the experimental data
are used to calculate the factors A and B for the alloys
investigated.
8 figures, 6 references.

Abstractor's note: Complete translation.

Card 2/2

S/020/61/136/001/010/037
B019/B056

AUTHORS: Dekhtyar, I. Ya. and Mikhalenkov, V. S.

TITLE: The Temperature Effect Produced Upon the Angular Correlation
              of the γ-Quanta Formed During the Annihilation of Positrons
              and Electrons in Bismuth

PERIODICAL: Doklady Akademii nauk SSSR, 1961, Vol.136, No.1, pp. 63-65

TEXT: In an earlier paper the authors investigated the angular dis-
tribution of the γ-quanta formed during the annihilation of positrons and
electrons in bismuth at room temperature. The investigations were carried
out on a bismuth single crystal and showed a marked anisotropy of the
energy surface cross section which is perpendicular to the main axis of
the crystal. The anisotropy is about 14%. The angular correlation curves,
among other things, depend on the interaction of the positrons and the lat-
tice vibrations. It is therefore of importance to know the effect produced
by temperature upon the angular correlation. In Fig. 2 the mean values of
the maximum momenta of the electrons in mc-units (m = photon mass,
c = velocity of light) for $300°K$ (curve 1) and for $90°K$ (curve 2) are

Card 1/3

The Temperature Effect Produced Upon the
Angular Correlation of the γ-Quanta Formed
During the Annihilation of Positrons and
Electrons in Bismuth

S/020/61/136/001/010/037
B019/B056

graphically represented. As may be seen, the anisotropy at $90°K$ is much
lower (about 8%) than at $300°K$ (about 15%). The results obtained indicate
a change in the character of the positron-electron annihilation. In the
case of low positron energy, the single-photon annihilation is considerably
less probable than the two-photon annihilation. In the case of positron
energies of about $10m_0$ (m_0 is the positron mass), the ratio between the
single-photon annihilation and the two-photon annihilation in bismuth is
0.2. The difference between the surfaces bounded by the curves 1 and 2 in
Fig. 1 yields the decrease of the total number of positrons taking part
in two-photon annihilation. This decrease is, in the given case, 30%. The
authors thank A. A. Smirnov and M. A. Krivoglaz for discussions. There are
2 figures, 1 table, and 3 references: 2 Soviet and 1 US.

ASSOCIATION: Institut metallofiziki Akademii nauk USSR (Institute of the
              Physics of Metals of the Academy of Sciences UkrSSR)

Card 2/3

The Temperature Effect Produced Upon the
Angular Correlation of the γ-Quanta Formed
During the Annihilation of Positrons and
Electrons in Bismuth

S/020/61/136/001/010/037
B019/B056

PRESENTED: July 15, 1960, by G. V. Kurdyumov, Academician

SUBMITTED: July 13, 1960

Legend to Fig. 1: Angular distribution of γ-quanta at 90°K (curve 1) and
at 300°K (curve 2). Legend to Fig. 2: Angular diagram of the effective
maximum momenta of electrons in bismuth at 300°K (curve 1) and at 90°K
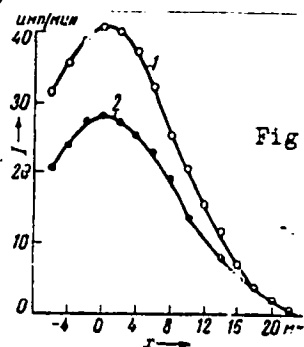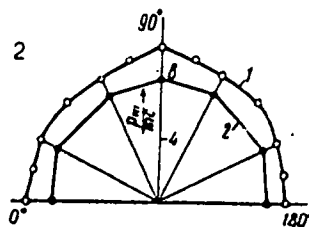(curve 2).

Fig. 1

Fig. 2

Card 3/3

S C.C 6
P 04 B'0.

AUTHORS: . Ya , and Mikha.enk:v 7 S

TITLE: ;·   · angular correlation of gamma ;·····
                       · electron annihilation in zin

PERIODICAL: .uk SSSR. Dok.aiy, v '40, n . ·

TEXT: The   1 the anisotropy in the .iect:··
zinc sing.   . 5 % Zn). Because if the differ-n·
distances 1   ane (2.6995 A) and in the plan-··
principal 4· ·   .   a considerable anis.trdpy of 'i-···
tum was t· · .   The angular distribution f th= ·· .
measured a· ·   r·om temperat.res. The ha.f-w :··
distributi.   nambiguousiy related to the max. .
momentum (h. =   T Stewart. Phys Rev 28. 4··
half-widths ·   r gamma quantum distributions ·   ··
the princip.   ⊥ (perpendicular ·· the prin ·+·
follows:
Card 1/3

Study of t...   ...elation of   S...
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                                       ^00 K
          l   .i.
          l.   .
The anis.t: !-w.dths a: r.'h temperatures
effective   n momenta are .etermined :r .
part of th.   .urves   The result .s 'he sa:
tropy. D..   ptibility f zin .rysta.s A
Rev., 71,   a Rev , 76. 4..., c2' .:.44 .   ..
ratures .r   these results   There .s a ...
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Card 2/3

Study of the angular correlation of ...

S/020/61/140/006/012/030
B104/B102

This corresponds to a contribution of single-photon annihilation. The authors thank I. A. Naskidashvili for having grown the single crystal. There are 1 table, 3 figures, and 8 references: 4 Soviet and 4 non-Soviet. The 2 most recent references to English-language publications read as follows: N. F. Mott, H. Jones, The Theory of the Properties of Metals and Alloys, London. 1938; A. T. Stewart, Canad. J. Phys., 35, 166 (1957).

PRESENTED: May 20, 1961, by G. V. Kurdyumov, Academician

SUBMITTED: May 18, 1961

Card 3/3

S/659/62/008/000/003/028
I048/I248

AUTHORS: Dekhtyar, I.Ya., Mikhalenkov, V.S., and Fedohenko, R.G.

TITLE: To the evaluation of atomic interaction in alloys at
             high temperatures

SOURCE: Akademii nauk SSSR. Institut metalurgii, Issledovaniya
             po zharoprochnym splavam. v.8. 1962. 31-35

TEXT: Experimental data showing the paramagnetic susceptibility
(χ) - temperature (up to 1000°C) relationship for Fe-Cr alloys con-
taining 12.4-41.6 at.% Cr is used as a basis for evaluating atomic
interactions within these alloys. The plot of $1/\chi$ vs. the tempera-
ture yields a straight line, except in the case of the alloy con-
taining 12.4 at.% Cr at temperatures exceeding 850°, where the
straight-line relationship is disturbed by an $\alpha \to \gamma$ transformation
within the alloy. A comparison of the experimental data with data
from the literature indicates that "n" (the number of bond-forming
electrons per atom, which is calculated from the χ-temperature

Card 1/2

S/659/62/008/000/003/028
I048/I248

To the evaluation of atomic interaction...

data) can be used as an index of the mechanical properties of the alloy, i.e., the elastic modulus increases with increasing n. It is assumed that strengthening of the interatomic bonds takes place with any changes in the structure of the solid solution which lead to changes in n similar to those caused by increasing the concentration of the second component of the alloy. An equation for the relationship between n and γ is derived:

$$\gamma = \frac{a \ (n_s + d_o) - n}{T - }^2 , \qquad (7)$$

where n_s is the total number of s-electrons, d_o is the average number of vacant d-levels (both per atom of the alloy), T is the temperature, ℓ is the Curie temperature, $a = N \mu_B^2 / 3R$, N is the Avogadro number, μ_h is the Bohr magneton, and R is the gas constant. There are 3 figures and 1 table.

Card 2/2

24.2800
18 9100

S/126/62/013/002/016/019
E039/E135

AUTHORS: Dekhtyar, I.Ya., Levina, D.A., and Mikhalenkov, V.S.

TITLE: Magnetic saturation of alloys of iron and nickel
            at high all sided pressures

PERIODICAL: Fizika metallov i metallovedeniye, v.13, no.2, 1962,
            308-310

TEXT: The authors studied the effect of high all sided
pressure on the magnetic saturation of nickel and of the alloys:
Ni + 23.7 at% Mn;   Fe + 36% Ni;   Fe + 36% Ni + 1% Mo;
Fe + 36% Ni + 2% Mo;   Fe + 36% Ni + 3% Mo;   Fe + 36% Ni + 4% Mo.
High pressures were generated by the change of volume on
solidification inside an improved design of thick walled high
pressure bomb. Magnetic saturation could be measured, by a
differential method, to an accuracy of ± 0.05%, in a field of
5000 oersted at room temperature. For all the investigated
materials the magnetic saturation decreased linearly with
increasing pressure over the range 1 to 10 000 atm (accuracy
± 30 atm). In the ordered alloy Ni + 23.7 at% Mn the change in
magnetic saturation with pressure is reversible. This verifies

Card 1/2

Magnetic saturation of alloys of ...   S/126/62/013/002/016/019
E039/E135

that the degree of order is not changed over the pressure range
investigated but that there is a change in the magnetic moment of
the atoms on account of the decrease in distance between them at
high pressures. The addition of 1% Mo to Fe + 36% Ni approximately
halved the relative change in magnetic saturation, but further
additions of Mo did not essentially change this value.   The
thermodynamic relations associated with those changes of magnetic
saturation are given and discussed. It is concluded that further
work is necessary in order to obtain a satisfactory explanation
of the processes occurring.
There is 1 table.
ASSOCIATION: Institut metallofiziki AN UkrSSR
             (Institute of Physics of Metals, AS UkrSSR)

SUBMITTED: April 21, 1961

Card 2/2

DEKHTYAR, I.Ya.; LEVINA, D.A.; MIKHALENKOV, V.S.

Effect of compression from all sides on the magnetization satura-
tion of iron-nickel alloys. Sbor. nauch. rab. Inst. metallofiz.
AN URSR no.14:37-45 '62.   (MIRA 15:6)
          (Iron-nickel alloys—Testing) (Magnetization)

S/601/62/000/015/003/010
A004/A127

AUTHORS: Dekhtyar, I.Ya., Mikhalenkov, V.S., Fedchenko, R.G.

TITLE: Rating of the interatomic action in ferrochromium alloys at high temperatures

SOURCE: Akademiya nauk Ukrayins'koyi RSR. Instytut metalofyzyky. Sbornik nauchnykh rabot. no. 15. Kiev, 1962. Voprosy fiziki metallov i metallovedeniya, 117 - 122

TEXT: The authors investigated the paramagnetic susceptibility vs temperature curve of ferrochromium alloys containing 12.4, 24.5, 33.6 and 41.6 atomic % Cr, respectively. The alloys were smelted in an induction-type vacuum furnace. The ingots were homogenized for 50 hours at 1,200°C, and then forged and drawn to 2 mm in diameter with subsequent 3-hour annealing at 900°C to relieve the drawing stresses. The paramagnetic susceptibility vs temperature curves obtained proved that the tested alloys comply with the Curie-Weiss law. A number of formulae and a table are presented. The investigation results reveal that, if in changes of the state of the solid solution, magnitude n is changed in the same direction as

Card 1/2

Rating of the interatomic action in ....

S/601/62/000/015/003/010
A004/A127

is the case with an increase in concentration of the second constituent, this will favor the "strengthening" of interatomic binding. There are 3 figures and 1 table.

SUBMITTED: March 10, 1961

Card 2/2

S/020/62/147/006/014/034
B104/B180

AUTHORS: Dekhtyar, I. Ya., Litovchenko, S. G., Mikhalenkov, V. S.

TITLE: Positron-electron annihilation in ordering alloys

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 147, no. 6, 1962, 1332-1335

TEXT: Methods developed in recent years are here used for the first time
to study the variation in the maximum momenta p_m of conduction electrons
on the ordering of the alloys Ni_3Mn, Cu_3Au and $CuAu$. The alloys differ
both structurally, and in the elastic stresses of the lattice, which are
due to the different atomic dimensions. For ordered-state $CuAu$ p_m is
$8.0 \cdot 10^{-3}$ mc, for disordered, $8.9 \cdot 10^{-3}$ mc. Similar results were obtained
with Ni_3Mn, but with Cu_3Au there is no difference in p_m for the ordered or
disordered states. $N(p)$ the momentum distribution of conduction electrons
in the Brillouin zone is plotted from the angular dependence of the
annihilation photons according to A. T. Stewart (Can. J. Phys., 35, 168
(1957)) (Fig. 2). The change in $N(p)$ on ordering primarily indicates

Card 1/2

Positron-electron annihilation ...

compression of the energy levels on formation of the energy gap ΔE (separation of the Brillouin zone into two halves). Further, as the total number of occupied energy levels remains constant, $N_{max}(p)$ must be larger for the ordered than the disordered state. The variation in the mean kinetic energy of electrons due to change in the degree of long-range order is investigated in a manner similar to that employed by H. Jones (Proc. Phys. Soc., 49, 243 (1937)) for the variation in Fermi energy on the α- and β-phase stabilization of brass. It is found that P_m diminishes on ordering. There are 2 figures.

ASSOCIATION: Institut metallofiziki Akademii nauk USSR (Institute of
               Physics of Metals of the Academy of Sciences UkrSSR)

PRESENTED: June 8, 1962, by G. V. Kurdyumov, Academician

SUBMITTED: June 4, 1962

Fig. 2
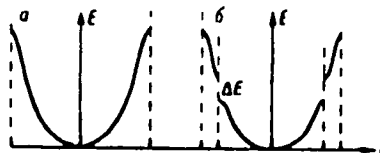
Card 2/2

ACCESSION NR: AT4013932   S/2659/63/010/000/0087/0092

AUTHOR: Dekhtyar, I. Ya.; Mirkin, I. L.; Mikhalenkov, V. S.; Fedchenko, R. G.;
Volkova, T. I.; Blanter, M. S.

TITLE: Investigation of the paramagnetic properties of high temperature alloys on an
iron and nickel base

SOURCE: AN SSSR. Institut metallurgii. Issledovaniya po zharoprochn*m splavam,
v. 10, 1963, 87-92

TOPIC TAGS: paramagnetic steel, high temperature alloy, iron alloy, nickel alloy,
chromium alloy, alloy paramagnetic property, paramagnetism

ABSTRACT: The temperature dependence of the paramagnetic properties of high temperature
alloys on an iron and nickel base was investigated as a guide to their electronic structure
and the effective number of electrons N. It was found that the maximum number of elec-
trons for nickel-chromium alloys is found in those containing 10% Cr. Addition of niobium
to an alloy of Ni + 16% Cr leads to significant increase in N. Investigation of complex alloys on
a nickel-chromium base showed that the maximum N is observed in alloys with aluminum
and titanium. Investigation of complex alloys on an iron-nickel-chromium base showed

Card 1/2

ACCESSION NR: AT4013932

that the effective magnetic moment connected with N is maximal in alloys containing tungs-
ten and molybdenum, while niobium, titanium and aluminum lead to a decrease in N. The
results obtained and their comparison with tensile strength studies show that the number of
electrons in the bond found on the basis of the temperature dependence of paramagnetic
sensitivity may characterize the strength of the interatomic bonds at high temperatures.
Orig. art. has: 3 figures, 2 tables and 9 formulas.

ASSOCIATION: Institut metallurgii AN SSSR (Metallurgical Institute AN SSSR)

SUBMITTED: 00   DATE ACQ: 27Feb64   ENCL: 00

SUB CODE: ML   NO REF SOV: 002   OTHER: 000

Card 2/2

DEKHTYAR, I.Ya.; LITOVCHENKO, S.G.; MIKHALENKOV, V.S.

Annihilation of positrons and electrons in iron-silicon alloys.
Sbor. nauch. rab. Inst. metallofiz. AN URSR no.17:50-54 '63.
(MIRA 17:3)

ACCESSION NR: AT4010696   ·8/2601/63/000/017/0120/0131

AUTHOR: Borisova, V. I.; Dekhtyar, I. Ya.; Madatova, E. G.; Mikhalenkov, V. S.;
Fedchenko, R. G.; Khazanov, M. S.

TITLE: Investigation of the effects of nonstationary heating on the changes in magnetic
and electrical properties of heat-resistant alloy ZhS-6K

SOURCE: AN UkrRSR. Insty*tut metalofizy*ky*. Sbornik nauchny*kh trudov. no. 17, 1963.
Voprosy* fiziki metallov i metallovedeniya, 120-131

TOPIC TAGS: alloy ZhS-6K, paramagnetic susceptibility, surface electrical resistance,
heat treatment, phase transformation, eddy current, heat resistance, magnetism, alloy
electrical property, heat resistant alloy

ABSTRACT: Application of new methods to the physical investigation of the phase and
structural changes occurring during cyclic heat treatment of heat-resistant materials is
very important. One of the methods used in this study is that of paramagnetic suscepti-
bility, by means of which it is possible to determine the interrelationship between struc-
tural changes and the states of phases, whether these changes are successive or simultan-
eous, and to what extent they occur during the process of thermal fatigue. In addition to
the above methods the following were also used: changes in thermal rigidity and
Card 1/3

ACCESSION NR: AT4010696

electrical resistance, form changes, and measurement of the surface electrical resis-
tance with determination of losses due to eddy currents. The first task was the investi-
gation of the effects of thermal stress on form changes and hardness of samples of the
alloy subjected to cyclic heat treatment. The results obtained showed that the linear
dimensions of alloys with high recrystallization temperatures did not change appreciably
as a result of thermal cycles. It is interesting to note that after 250 thermocycles with
cooling in water, breakage occurred without noticeable change in the length of the samples.
Thermal rigidity of samples was measured in a standard VIM-1M apparatus. It was
found that the changes in hardness resulting from thermal treatment depend not on ther-
mal stresses but on changes in the fine crystalline structure of the alloys. The dependence
of the electrical resistance of the alloy on heat changes during thermal treatment was
studied by the potentiometric method using a standard PPTN bridge. It was found that
resistance decreases up to 50 thermocycles. The absolute minimum occurs at about
325 cycles after which there is a continuous increase up to 600 cycles. The study of
paramagnetic susceptibility showed that during heat treatment there was a continuous
decrease in the hard solution of the matrix due to the alloying components. This process
should cause a decrease in electrical resistance. The sharp increase after 325 cycles is

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ACCESSION NR: AT4010696

difficult to explain. For the exact explanation of the process involved it is necessary to
employ new methods using structural sensitivity characteristics and phase composition.
The study of paramagnetic susceptibility demands a thorough study of structural and phase
changes occurring during cyclic heat treatment. For measurements of susceptibility a
special unit was designed which utilized the compensatory method of measurement. The
following conclusions were reached: cyclic heat treatment, with cooling in a stream of air,
of thin samples 3 mm in diameter merely leads to acceleration of the aging process. With
samples of complicated form a considerable stress gradient developed during heat treat-
ment leading to an unbalanced redistribution of elements. Under these conditions the
appearance of cracks is more probable. The study of paramagnetic susceptibility of the
alloy showed that for 3mm samples susceptibility increases evenly. No anomalies were
observed, a fact which is explained by the almost total absence of a gradient of thermal
stresses during cooling. Orig. art. has 5 formulas, 7 figures, and 1 table.

ASSOCIATION: Insty*tut metalofizy*ky* AN UkrRSR (Institute of the Metallurgical Physics
of Metals AN Ukr RSR)

SUBMITTED: 00   DATE ACQ: 31Jan 64   ENCL: 00

SUB CODE: MM   NO REF SOV: 001   OTHER: 002

Card 3/3

DEKHTYAR I.Ya.; MIKHALENKOV, V.S.

Effect of defects of the crystal lattice on the susceptibility of paramagnetic metals. Fiz. tver. tela 5 n .10:2977-3002 O '63.
(MIRA 16.11)

1. Institut metallofiziki AN UkrSSR, Kiyev.

L 8830-65   EWT(m)/T/EWP(q)/EWP(b)/EWA(m)-2   AS(mp)-2/ASD(a)-5/RAEM(a)/
AFWL/AFMDC/SSD/ESD(gs)/ESD(t)/RAEM(t)   JD/JG

ACCESSION NR: AT4042842   S/2601/64/000/018/0198/0201

AUTHOR: Dekhtyar, I. Ya. ; Litovchenko, S. G. ; Mikhalenkov, V. S.

TITLE: Annihilation of positrons by electrons in gadolinium

SOURCE: AN UkrSSR. Institut metallofiziki. Sbornik nauchny*kh rabot, no. 18, 1964.
Voprosy* fiziki metallov i metallovedeniya (Problems in the physics of metal and physical
metallurgy), 198-201

TOPIC TAGS: gadolinium, transition element, positron, electron, positron annihilation,
gamma radiation, gamma ray distribution, antiferromagnetism, paramagnetism, Curie
point, electron spin, spin cluster, Fermi boundary

ABSTRACT: On the basis of previous work, the transition from the antiferromagnetic to the
paramagnetic state, which is accompanied by a change in the density of electron states,
would be expected to have a definite effect on the form of the angular distribution of the γ-
quanta arising during the annihilation of positrons by electrons. The present authors,
therefore, studied the annihilation of positrons by electrons in 99.8% pure polycrystalline
gadolinium during transition through the Curie point (289K). A comparison of the angular
distribution of the γ-quanta obtained at 11 and 20C, corresponding to the ferromagnetic and
Card 1/3

L 8830-65

ACCESSION NR: AT4042842   /

paramagnetic states, respectively, showed that the density of states at the Fermi boundary
increases by about 15% on passage through the Curie point (see Fig. 1 of the Enclosure).
The agreement between those findings and the changes in certain other physical properties
of gadolinium during magnetic transformation indicates that all these effects are due to a
change in the state of the electrons resulting from the change in the character of spin
ordering at the Curie point; below this point, there is distant ordering of parallel spins,
while above it there is close ordering, resulting in spin clusters. It is pointed out, however,
that detailed analysis of these effects is made difficult by the contribution of the lower
electron levels to the γ-spectrum of the transition elements. Orig. art. has: 2 figures.

ASSOCIATION: Institut metallofiziki AN UkrSSR (Institute of the Physics of Metals,
AN UkrSSR).

SUBMITTED: 14Mar63   ATD PRESS: 3106   ENCL: 01

SUB CODE: NP, MM   NO REF SOV: 004   OTHER: 006

Card 2/3

L 8830-65

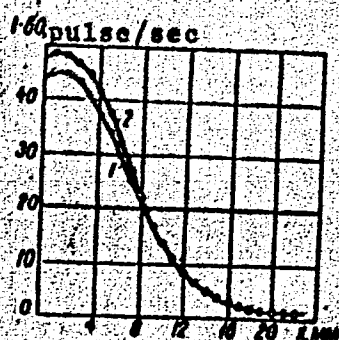ACCESSION NR: AT4042842   ENCLOSURE: 01

Fig. 1. Angular distribution of the γ-quanta arising as the result of annihilation:
1 — temperature = 20C; 2 — temperature = 11C.

Card 3/3

DEKHTYAR, I.Ya.; LEVIN, L.A.; MIKHALENKO, V...

EHG of p... of mutti r... ne annihilat n........ :
positrons wit... oe in metals, thermal, thermal, inst.
Metallofiz. AN ...E r .,1961,no. 6; i...   ...Mi.. IP:s,

8/0020/64/156/004/0795/0798

ACCESSION NR: AP4041147

AUTHOR: Dekhtyar, I. Ya.; Levina, D. A.; Mikhalenkov, V. S. ; Kurdyumov, G. V. (Academician)

TITLE: Annihilation of positron and electrons in plastically deformed spectra

SOURCE: AN SSSR. Doklady*, v. 156, no. 4, 1964. 795-798

TOPIC TAGS: electron positron annihilation spectra, plastically deformed metal, nickel iron alloy, electron energy distribution

ABSTRACT: The authors used the method of electron-positron annihilation in metals for the study of the effect of plastic deformation on electronic structure, since the annihilation spectra gives information about the energy distribution of electrons in metals. The study was conducted on nickel and iron-nickel alloy of invar composition because the physical properties of these metals are determined by the interaction and distribution of d- and s-electrons, and because the contribution of d-electrons to the annihilation spectra is considerable. The method was described by the authors earlier (Voprosy* fiz. met. i metalloved, no. 12, 46 (1961)). The positron source was Na^{22}. The specimen were deformed by rolling to about 75% and were annealed in argon at 950C for 3 hours. The angular distribution

Card   1/2

ACCESSION NR: AP4041147

of gamma-rays was measured with a scintillation counter. In the region of maximum, the annihilation radiation was larger for deformed specimen than for the annealed ones. The results are qualitatively interpreted in terms of the influence of the redistribution of s- and d-electrons in the distorted regions of the crystals around dislocations, and a subsequent redistribution of electronic momenta. Orig. art. has: 1 figure.

ASSOCIATION: Institut metallofiziki, Akademii nauk USSR. (Institute of Physics of Metals, Academy of Sciences USSR)

SUBMITTED: 13Jan64

SUB CODE: NP, MM

NO REF SOV: 005

ENCL: 00

OTHER: 003

L. 41025-66   AWT(m)/T/EWP(w)/ETI/EWP(t)   IJP(c)   JD/HW/CD

ACC NR: AT6009601   (N)   SOURCE CODE: UR/0000/65/000/000/0112/0119

AUTHOR: Dekhtyar, I. Ya.; Mikhalenkov, V. S.; Sakharova, S. G.

ORG: Institute of Metal Physics, AN UkrSSR (Institut metallofiziki AN UkrSSR)

TITLE: Effect of packing defects on the spectra of annihilation of positrons with electrons in nickel-copper alloys

SOURCE: AN UkrSSR. Fizicheskaya priroda khrupkogo razrusheniya metallov (Physical nature of brittle failure of metals). Kiev, Izd-vo Naukova dumka, 1965, 112-119

TOPIC TAGS: lattice defect, particle annihilation, positron, electron, nickel base alloy, copper alloy

ABSTRACT: So far no direct experimental findings have been obtained on the effect of packing defects on the energy spectrum of electrons. To fill this gap, the authors investigated the variation of this spectrum by the method of the annihilation of positrons with electrons, since this method provides information on the effect of plastic deformation on the energy spectrum of electrons. Pure Ni as well as its alloys with 10, 20 and 30% Cu were investigated (as the Cu content increases to 30%, the energy of the packing defects in these alloys decreases al-

Card 1/2

. L 41025-66

ACC NR: AT6009601

most three times), proceeding from the premise that, given an identical degree of deformation (~80% in this case) of the specimens of the alloys investigated, the density of packing defects will be the higher the greater is the probability $\propto$ of their formation. The specimens were deformed by rolling. Curves of the angular distribution of γ-quanta during annihilation of positrons with electrons in the investigated alloys in vacuum-annealed (900°C for 3 hr) and deformed states were plotted with the aid of a shielded-emitter unit. The positron source was the isotope Na-22 (activity 3 μcuries). Findings: the maximum variations in the annihilation spectra were recorded for the alloy with the greated probability of formation of packing defects and the lowest energy of packing defects, i.e. for the alloy with 30% Cu. For the deformed specimens the curve of angular distribution of γ-quanta is steeper than for the annealed specimens. This means that, since most of the annihilation acts take place on d-electrons, (and thus the density of occupied states in the d-band increases), the mean electron momentum in the d-shell decreases for specimens in deformed state. The formation of a packing defect, with its attendant decrease in the mean electron momentum in the d-band, must lead to an increase in the maximum annihilation rate; this decrease is also associated with the decrease in the effective mass of electrons. This project is the first of a series devoted to the investigation of the relationship between the electron structure of alloys and packing defects. Orig. art. has: 3 figures, 3 formulas.

SUB CODE: 20, 13, 11/ SUBM DATE: 12Oct64/ ORIG REF: 001/ OTH REF: 006

Card 2/2 hs

L 41713-66   EWT(m)/T/EWP(t)/ETI/EWP(k)   IJP(c)   JD/HW/JG

ACC NR: AP6019528   (N)   SOURCE CODE: UR/0020/66/168/004/0785/0787

AUTHOR: Dekhtyar, I. Ya.; Mikhalenkov, V. S.; Sakharova, S. G.

ORG: Institute of Metal Physics, Academy of Sciences UkrSSR (Institut metallofiziki Akademii nauk UkrSSR)

TITLE: Annihilation of positrons by electrons in plastically deformed metals with bcc lattice

SOURCE: AN SSSR. Doklady, v. 168, no. 4, 1966, 785-787

TOPIC TAGS: particle annihilation, electron positron pair, electron spectrum, deformed metal, plastic deformation, crystal dislocation phenomenon, crystal defect

ABSTRACT: This is a continuation of earlier work (DAN v. 156, 795, 1965) where it was shown that an investigation of annihilation spectra in plastically deformed metals discloses changes in the electron energy spectrum. The present article reports results obtained for Ta, Nb, Fe, and Fe + 0.63% Al and Fe + 1.08% Al solid solutions. The procedure used to obtain the annihilation spectra was described earlier (Vopr. fiz. met. i metallovedeniya, no. 12, 46, 1961). The apparatus was modified to provide accumulation of larger statistical material. The angular distribution of the annihilation photons was plotted first for the stressed and then for the annealed material. The stress was produced by rolling in two mutually perpendicular directions and the strain was 75-80% in all samples. The results indicate that the s- and d-electrons become redistributed in the distortion field around the

Card 1/2   UDC: 539.21

L 41713-66

ACC NR: AP6019528   /

dislocations. Proof that the observed change in shape of the annihilation spectra is due to dislocations and not to point defects is the fact that annealing demonstrates these changes to occur at temperatures corresponding to intense dislocation. The elastic properties of the metal govern the maximum polarization, the excess dislocation charge, and the relative change of the annihilation rates, so that the measurement of the spectra yields new data on the electronic nature of defects of the dislocation type. As in the earlier work, the maximum intensity of the spectrum is increased by the deformation, but the half-width of the annihilation curve decreases. Alloying with aluminum, by affecting the stacking-fault energy, increases the polarization, but there are not enough data to explain this fact. Nor are the data sufficient to explain the specific features of the different crystal structures and their relation to the annihilation spectra. This report was presented by Academician G. V. Kurdyumov 11 September 1965. Orig. art. has: 2 figures, 5 formulas, and 1 table.

SUB CODE: 20/   SUBM DATE: 31Aug65/   ORIG REF: 004/   OTH REF: 001

Card 2/2

DEKHTYAR, I.Ya.; LITOVCHENKO, S.G.; MIKHALENKOV, V.S.

Annihilation of positrons with electrons in gadolinium. Sber.
nauch. rab. Inst. metallofiz. AN URSR no.18:198-201 '64
                                              (MIRA 17:8)

MIKHALENKOV, Ya., geroy Sovetskogo Soyusa; CHECHNEVA, M., geroy Sovetskogo
      Soyuza; VINOKUROV, A.

The lag in flying as a sport is intolerable; letter to the editor.
Kryl. rod. 8 no.2:16 F '57.   (MLRA 10:4)

1. Starshiy instruktor-letchik Moskovskogo gorodskogo aerokluba
(for Vinokurov).
    (Aeronautics)   (Military education)

ISAYEV, A.I., professor, doktor tekhnicheskikh nauk; MIKHALENOK, Ye.I., kandidat tekhnicheskikh nauk; TARASEVICH, Yu.S., kandidat tekhnicheskikh nauk, redaktor; POPOVA, S.M., tekhnicheskiy redaktor.

[Speed turning of large parts with broad cutters] Skorostnoe tochenie krupnykh detalei shirokimi reztsami. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. lit-ry, 1954. 87 p.   (MLRA 8:5)
        (Metal cutting) (Cutting tools)

MIKHALENOK, Ye.I., kand.tekhn.nauk; Prinimal uchastiye: ISAYEV, A.I.,
doktor tekhn.nauk, prof.

Calculating allowances and determining the economic efficiency of
their reduction in large forgings and castings. [Trudy] TSNIITMASH
102:91-118 '61.

(Tolerance (Engineering))   (MIRA 14:10)

"A New Preparation -- Antirabies Gamma Globulin," by Z. V. Mi-
khalenok, Voprosy Virusologii, Vol 2, No 1, Jan-Feb 57, p 56

The article announces the preparation of antirabies gamma globulin
at the Moscow Institute of Vaccines and Sera imeni I. I. Mechnikov under
the direction of Prof V. D. Solov'yev. The preparation was produced from
equine antirabies serum hyperimmunized with a production-fixed strain of
rabies virus. On the basis of a laboratory study of the effectiveness
of antirabies gamma globulin in animals experimentally infected with street
rabies virus, a directive concerning the preparation and use of this sub-
stance was approved by the Serum-Vaccine Commission of the Ministry of
Health USSR.

The use of antirabies gamma globulin in conjunction with vaccination
for the specific prophylaxis of rabies is recommended after deep or multiple
bites at any site, including bites on the face or head, by rabid animals
or animals suspected of rabies, particularly wolves. The article states
that the gamma globulin evidently confers passive immunity immediately
after its administration; the immunity lasts for a period of 2-3 weeks.
This effect supplements that of the active immunity brought about by
the inoculation of antirabies vaccine.

Detailed procedure is given for the administration of antirabies gamma globulin, which is introduced intramuscularly in a dose of 0.25 ml per 1 kg wt. Desensitization is previously effected by the sub-cutaneous introduction of 0.1 ml of gamma globulin diluted in distilled water (1:10). The entire dose of gamma globulin, heated to 36-37° in warm water, is introduced after 30 minutes.

The article states that the preparation should be administered no later than 72 hours after bites; within 24 hours after this procedure, an inoculation course of Fermi type antirabies vaccine should be initi-ated: 5 ml daily for 21 days. In the event of particularly severe bites, up to 5-7 injections of gamma globulin can be given at intervals of 1-2 days. In this case, the interval between the introduction of gamma globu-lin and vaccine should be 2-3 hours.

The use of gamma globulin is recommended after bites of rabid animals when vaccination must be discontinued because of the development of post-vaccinal paralysis. Depending on the condition of the patient and how he withstands the gamma globulin, up to 3-6 daily doses of this preparation can be introduced at intervals of 1-2 days.

It is mentioned that gamma globulin was also tested by the Moscow Scientific Research Institute imeni I. I. Mechnikov for therapy of post-vaccinal paralysis suspected in view of their etiology of resulting from disease produced by fixed rabies virus. Antirabies gamma globulin was also tested for therapy of rabies combined with induced sleep. (U)

MIKHALENOK, Z.V.

A new apparatus for mass prophylactic vaccination against influenza.
Vop.virus. 3 no.5:315-316 S-O '58   (MIRA 11:10)
        (INFLUENZA, prev. & control, vacc., appar.
            for mass applications (Rus))

26.2340
26.1632

22910

S/109/61/006/004/025/025
E032/E314

AUTHORS: Aleskovskiy, Yu.M., Granovskiy, V.L. and
Mikhalets, Ye.

TITLE: Recombinational Emission of a Caesium Plasma in
a Magnetic Field

PERIODICAL: Radiotekhnika i elektronika, 1961, Vol. 6,
No. 4, pp. 674 - 675

TEXT: When a longitudinal magnetic field is applied to the
positive column of a low-pressure discharge, it reduces the
diffusion of electrons and ions towards the walls in the
direction perpendicular to the field. As a result, the mean
lifetime of current carriers in the plasma is increased.
The ion balance is maintained at a lower ionisation frequency
and hence in a stationary plasma the longitudinal electric
field and the electron temperature are reduced. This can be
confirmed experimentally (Ref. 2). In this connection, it
may be supposed that the fraction of charged particles
disappearing from the plasma as a result of volume
recombination should increase in the magnetic field
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22910

Recombinational Emission S/109/61/006/004/025/025
EO32/E314

(I.A. Vasil'yeva - Ref. 3). The absolute number of recombinations should also increase somewhat. However, spectroscopic observations of the recombinational emission reported by Davies (Ref. 5) are not in agreement with the above ideas. The present authors have investigated the effect of a magnetic field on the electron recombination in a stationary discharge in low-pressure caesium vapour. The intensity of the recombinational continuum with the limit at 4943 Å, corresponding to the capture of electrons to the level $Cs6P_{1/2}$ (Ref. 6), was measured. The discharge tube was 25 mm in diameter and was located in a uniform magnetic field produced by two solenoids. The radiation was examined through a gap between the solenoids. The discharge current was varied between 1 and 2.5 A and the caesium vapour pressure between 2 and 130 μ. It was found that the emission of the positive column was very dependent on the magnetic field. The intensities of all the emission lines

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Recombinational Emission .... $\quad$ S/109/61/006/004/025/025
EO32/E314

of caesium decreased with increasing magnetic field. On
the other hand, the recombinational emission increased with
the magnetic field and this was particularly well defined
at low pressures. The figure shows the intensity of
recombinational emission as a function of the magnetic field
at different caesium vapour pressures. The numbers 1, 2,
3, and 4 refer to pressures of 8.2, 18, 36 and 74 μ, respectively.
There are 1 figure and 6 references: 2 Soviet and
4 non-Soviet.

ASSOCIATION: Fizich·skiy fakul'tet Moskovskogo
gosudarstvennogo universiteta im. M.V. Lomonosova
(Physics Department of Moscow State University
im. M.V. Lomonosov)

SUBMITTED: $\quad$ January 5, 1961

Card 3/4

MIKHALETSKI, M., Cand Tech Sci -- (diss) "Research into the dynamics of heat generation in two-cycle motors, as transported by pressure charging." Leningrad, 1960. 24 pp; (Leningrad Ship-Building Inst); 200 copies; price not given; (KL, 26-60, 136)

MIKHALETSKIY M.

Precising the correlations determining the dependence of heat release in diesel-type engines. Trudy LKI no.34:161-171 '61.

(MIRA 15:8)

1. Kafedra sudovykh dvigateley vnutrennego sgoraniya Leningradskogo korablestroitel'nogo instituta.

(Marine diesel engines) (Heat—Transmission)

1. MIKHALEV, A.; GORELOV, V.

2. USSR (600)

4. Cotton Growing

7. Practices of the Pakhta-Abad Machine-Tractor Station in the fight for abundant
    yields of cotton. Khlopkovodstvo no. 7, 1952

9. Monthly List of Russian Accessions, Library of Congress, __January__ 1953. Unclassified.

LRVI I.I.; MIHHALEV A.L.

Approximate method for calculating a flow in a region of sudden
expansion in the presence of a magnetic field. Mag. gidr.
no.3:41-43 '65.   (MIRA 18:10)

MIKHALEV, A. F.

"Histological Observations on the egeneration of Bone Tissue in Fish."
Cand Biol Sci, Molotove Medical Inst, Molotov, 1954. (RZhBiol, No 1, Jan 55)

Survey of Scientific and Technical Dissertations Defended At USSR Higher
Educational Institutions (12) SC: Sum. 598, 20 Jul 55

MIKHALEV, A.N., inzh.

Design of magnetostrictive filters. Trudy LIIZHT no.176:89-98
'61.
(Electric filters)   (MIRA 15:5)

MIKHALEV, A.N., inzh.

Use of the converter theory in the analysis of an annular magnetostriction resonator. Sbor. trud. LIIZHT no.179:151-154 '61.   (MIRA 16:11)

ACC NR: AR7008653

AUTHOR: Mikhalev, A. S.

SOURCE CODE: UR/0372/66/000/012/G032/G032

TITLE: A highly reliable actuator for automatic control systems

SOURCE: Ref. zh. Kibernetika, Abs. 12G202

REF SOURCE: Izv. Leningr. elektrotekhn. in-ta, vyp. 56, ch. 3, 1966, 116-121

TOPIC TAGS: automatic control system, magnetic amplifier, automatic control reliability, electric motor

ABSTRACT: It is pointed out that the actuating element in automatic control systems is quite frequently an asynchronous two-phase motor in which the field coil is permanently connected to the power supply through a phase-shifting capacitor while an amplifier is used for feeding the control winding. It is readily apparent in this case that excitation power is required only when there is an error signal. In principle, the field coil may be disconnected from the supply circuit under rest conditions. Heating of motor and amplifier may be appreciably reduced by applying this principle to remote control systems for which the ratio of error adjustment time to rest time in the system is considerably less than unity. This increases the reliability of the remote control system, improves its economic indices and also increases the starting moment on the motor shaft. A characteristic of the proposed system is that the field winding of the asynchronous two-phase motor is connected in the output

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UDC: 62-507.019.3

ACC NR: AR7008653

diagonal of a full-wave bridge magamp, while the control winding is connected through a phase-shifting capacitor to the second diagonal of the magamp. This gives a rather simple means for reducing heating in both motor and amplifier, and consequently increasing the reliability of the automatic control system. V. M. [Translation of abstract]

SUB CODE: 13

Card   2/2

MIKHALEV, A.V.

On the isomorphism of rings of continuous endomorphisms. Sib.mat.
zhur. 4 no.1:177-186 Ja-F '63.   (MIRA 16:2)
        (Rings (Algebra))   (Topology)

MIKHALEV, A.V.

Special structural spaces of rings. Dokl. AN SSSR 150 no.2:
259-261 My '63. (MIRA 16:5)

1. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova.
Predstavleno akademikom A.I.Mal'tsevym.
(Rings (Algebra))

MIKHALEV, A. YA.

"Physiological Changes in Potato Plants at High Temper-
atures in Southern Regions." Inst of Physiology of Plants imeni K. A.
Timiryazev Acad Sci USSR, Moscow, 1955. Dissertation for the Degree of
Candiate in Biological Sciences)

SO: M-955, 16 Feb 56

KHANANASHVILI, L.M.; MYSHLYAYEVA, L.V.; MIKHALEV, B.M.; SHKOL'NYY, V.Ye.

Effect of the aqueous solutions of sodium aluminates on
alkylakoxysilanes. Zhur.prikl.khim. 30 no.2:263-271 F '57.

(MLRA 10:5)

1.Kafedra analiticheskoy khimii Moskovskogo khimiko-tekhnologicheskogo
instituta imeni D.I. Mendeleyeva.
                (Sodium aluminates) (Silane)

VASIL'YEV, Yu.S., dots., kand. tekhn. nauk; VEL'NER, Kh.A., dots.,
        kand. tekhn. nauk; GINDUS, D.O., inzh.; GOLOVACHEVSKIY,
        N.I., dots., kand. tekhn. nauk; GROMOV, A.I., inzh.;
        DOMANSKIY, L.K., inzh.; ISAYEV, Yu.M., inzh.; KULESH, N.P.,
        dots., kand. tekhn. nauk; MIKHALEV, B.N., dots., kand.
        tekhn. nauk; MOROZOV, A.A., prof., doktor tekhn. nauk
        [deceased]; NALIMOV, S.M., st. nauchn. sotr., kand. tekhn.
        nauk; REZNIKOVSKIY, A.Sh., kand. tekhn. nauk; SVANIDZE, G.G.,
        doktor tekhn. nauk; TANANAYEV, A.V., dots., kand. tekhn. nauk;
        KHAZANOVA, A.Z., inzh.; CHERNYATIN, I.A., st. nauchn.
        sotr., kand. tekhn. nauk; SHCHAVELEV, D.S., prof., doktor
        tekhn. nauk; YAGODIN, N.N., st. nauchn. sotr., kand. tekhn.
        nauk; LEONOVA, B.I., red.

[Utilization of water power] Ispol'zovanie vodnoi energii.
Moskva, Energiia, 1965.   563 p.   (MIRA 19:1)

MIKHALEV, Boris Nikolayevich; KOKYAKIN, Yu.I., retsenzent;
USOV, S.V., red.

[Atomic power stations; abstract of lectures for students of
hydrotechnical faculties majoring in hydraulic power engineer-
ing] Atomnye elektricheskie stantsii; konspekt lektsii dlia
studentov gidroenergeticheskoi spetsial'nosti gidrotekhniche-
skogo fakul'teta. Leningrad, Leningr. politekhn. in-t, 1963.
51 p.   (MIRA 18:4)

MIKHALEV, B.N., kand.tekhn.nauk, dotsent

Use of isolators and short-circuiting devices in systems of
hydroelectric power stations. Izv.vys.ucheb.zav.; energ. 6
no.1:17-24 Ja '63.   (MIRA 16:2)

1. Leningradskiy politekhnicheskiy institut imeni M.I. Kalinina.
Predstavlena kafedroy elektricheskikh stantsiy.
      (Hydroelectric power stations) (Electric switchgear)

PHASE I BOOK EXPLOITATION   SOV/3901

Novoye v elektricheskoy i ul'trazvukovoy obrabotke materialov (New Developments in Electrical and Ultrasonic Machining of Materials) [Leningrad], Lenizdat, 1959. 261 p. 5,000 copies printed.

Ed. (title page): L.Ya. Popilov; Ed. (inside book): S.I. Berechev. skaya; Tech. Ed.: P.S. Smirnov.

PURPOSE: This book is intended for technical personnel and produc- tion workers.

COVERAGE: This is a collection of 20 articles presented at the Third All-Union Conference of the Scientific and Technical Society of the Machine Industry on Electrical and Ultrasonic Machining of Metals, held in Leningrad. The articles deal with the latest achievements in the field of electrical and ultrasonic machining of metals. New methods of machining presently being developed are described. References follow several of the articles.

AVAILABLE: Library of Congress (TJ1191.P23)

Card 1/?   VK/ps/jb
8-12-60

MIKHALEV, B,Ye,

Features of using ultrasonic control and test devices in the
food industry. Prib. i sred. kompl. avtomatiz. no.2:14-26 '63.
(MIRA 17:12)

KOREPIN, Yevgeniy Andreyevich, kand.tekhn.nauk; MIKHALEV, B.Ye., inzh., red.; FREGER, D.P., izd.red.; GVIRTS, V.L., tekhn.red.

[Ferroelectric accelerometer converters] P'ezoelektricheskie preobrazovateli akselerometrov. Leningrad, 1960. 23 p. (Leningradskii dom nauchno-tekhnicheskoi propagandy. Obmen peredovym opytom, no.39. Seriia: Pribory i elementy avtomatiki, vyp.5)

(MIRA 14:1)

(Accelerometers)

S/887/61/000/000/006/069
E073/E155

AUTHORS: Babikov, O.I., Korepin, Ye.A., Mikhalev, B.Ye., and Belyayev, Yu.V.

TITLE: Piezoelectric ultrasonic radiator.
(A.c. no. 117326, cl. 42s (no.598828 of April 28, 1958)).

SOURCE: Sbornik izobreteniy i ultrazvuk i yego primeneniye. Kom. po delam izobr. i otkrytiy. Moscow, Tsentr. byuro tekhn. inform., 1961, 14-15

TEXT: A cylindrical piezoelectric ultrasonic radiator is proposed for effective cleaning of the internal surfaces of components (for instance internal surfaces of tubes) in cleaning baths. This consists of a radially polarised piezo-element designed as a hermetically sealed hollow cylinder. This design of radiator ensures that only the outer surface emits ultrasonics. The radiator (Fig.10) consists of a cylindrical, hollow piezo-element, the body 2, the lid 3 and the components which supply the piezo-element. Sealing gaskets ensure hermetic sealing of the internal cavity of the radiator. Deformation of the insulating and sealing gaskets is prevented by flat springs. The silver

Card 1/3

Piezoelectric ultrasonic radiator   S/887/61/000/000/006/069
E073/E155

coating of the radiator is protected by a layer of vinyflex.
The proposed radiator is economical and convenient in use. It
has been acknowledged useful by the Akusticheskiy institut AN SSSR
(Acoustics Institute, AS USSR).
There is 1 figure.
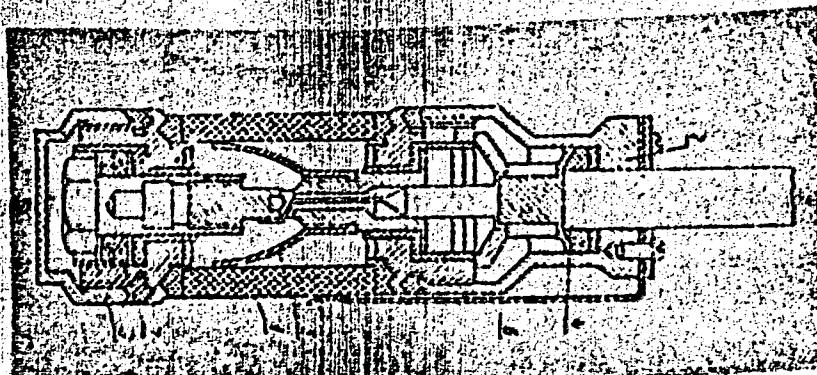[Abstractor's note: Complete translation.]

Fig. 10.   1 - piezoelectric projector;   2 - body;   3 - lid;
4 - cable;   5 - spring contact;   6 - contact plate;
7 - flat springs.

Card 2/3

Piezoelectric ultrasonic radiator

S/887/61/000/000/006/069
E073/E155

Fig. 10

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MIKHALEV, D.I., elektromekhanik

      Device for checking radio transmitters. Avtom., telem. i sviaz' 6
no.7:43 Jl '62.   (MIRA 16:2)

      1. Likhoborskaya distantsiya signalizatsii i svyazi Moskovskoy
dorogi.
           (Railroads—Electronic equipment)   (Radio—Testing)

MIKHALEV, D. N.

3

The great and minor epochs of accumulation of manganiferous sediments. D. N. Mikhalev. *Compt. rend.
acad. sci. U.R.S.S.* 54, 561-11(1946)(in English).—The
principal Mn deposits of the world are of sedimentary
origin and are located along borders of geosynclinal zones.
The Pre-Cambrian and Tertiary are the two major epochs
of Mn-ore formation (often assocd. with siliceous sediments). The geol. and geographic distribution of the Mn
deposits in the U.S.S.R. is surveyed.   E. W. C.

EH

9-16-54

MIKHAL'V, B. N.

The follow ng is among dissertations of the Leningrad Polytechnic
Institute imeni Kalinin:

"Rational Solutions of the Electrical Section of Runoff Hydroelectric
Stations." 2 July 1953. New conditions are determined which are brought
about by the construction of combination hydroelectric stations and by the
contemporary development of science and engineering as starting data for
accomplishing the electrical section of such structures. An analysis is
given of possible solutions of the electrical section for each type of
combination state electric stations and rational solutions with respect to
the selection of systems of electrical circuits, layout of the equipment,
and construction of the electrical section of runoff state electric stations.
The results are generalized for untilzation in the construction of numerous
runoff hydroelectric stations in accordance with the prospective plan for
the development of the power base of the national economy of the country.

SO: M-1048, 28 Mar 56

MIKHALEV, D.N.

The 1960 earthquakes in Chile. Izv. Vses. geog. ob-va 94 no.4:349-
351 Jl-Ag '62.   (MIRA 15:9)
            (Chile—Earthquakes)

MIKHALEV, F. I.

U S S R /.

Casting steel shot. P. T. Efimov, F. I. Mikhalev, and P. G. Karpov. Litrinor Proizvodstvo 1956, No. 6, 1-3.— Steel shot for shot blasting and well drilling tools. 0.8-1.1% C, 0.5-0.8 Mn, 0.2-0.7 Si is made by pouring molten steel through 10-14-mm. nozzles on a steel drum partially immersed in a water tank and rotating at a peripheral speed slightly greater or equal to the falling velocity of an element of steel stream, and carrying on its surface a layer of water 3-3.5 mm. thick. Normal shot formation takes place when the stream falls on a surface inclined to the horizontal not more than 5°, which is provided by a drum 380-420 mm. in diam. The walls of the tank should not be closer than 2.5-3 in. to the drum to prevent sticking of molten drops to them. About 70% of the charge is converted into shot free from porosity and 60% of which lie between 0.8 and 5.0 mm. diam.

T. D. C.

MIKHALEV, G.P.; ARZHAKOV, N.D.

Some geological characteristics of Lower Jurassic diamond-bearing sediments in the "Mir" kimberlite pipe region. Nauch.soob. IAFAN SSSR no.7:113-119 '62.   (MIRA 16:3)

(Yakutia—Kimberlite)

ROZHKOV, Ivan Sergeyevich; MIKHALEV, Gay Petrovich; ZARETSKIY,
Leonid Mikhaylovich. Prinimala uchastiye NEKRASOVA, R.A.;
VANYUKOVA, G.M., red.izd-va; SAKS,V.N.,otv.red.;RYLINA,Yu.V.,
tekhn.red.

[Diamond-bearing placers in the Malaya Botuobiya region of
western Yakutia; conditions governing their formation, the
composition of continental sediments, and genetic types]
Almazonosnye rossypi Malo-Botuobinskogo raiona zapadnoi
IAkutii; usloviia ikh formirovaniia, sostav kontinental'-
nykh otlozhenii i geneticheskie tipy. Moskva, Izd-vo AN
SSSR, 1963. 136 p.   (MIRA 16:10)

1. Chlen-korrespondent AN SSSR (for Saks).
    (Malaya Botuobiya Valley--Diamonds)

ROZHKOV, I.S.; MIKHALEV, G.P.

Genetic types of the diamond-bearing placer deposits in the
Malaya Botuobiya Valley. Trudy IAFAN AN SSSR Ser. geol. no.9:
106-114 '63.   (MIRA 16:12)

ROZHKOV, I.S.; MIKHALEV, G.P.

Second Conference on the Geology of Mineral Placer Deposits.
Geol. rud. mestorozh. 6 no.3:113-116 My-Je '64

(MIRA 18:1)

VOL, TS., inzh.; KOVALEV, A., inzh.; MIKHALEV, I., inzh.

Gluing friction facings. Avt.transp. 37 no.4:24-28 Ap '59.
(MIRA 12:6)

(Automobiles--Brakes)